



Spectral Gamma-Ray Borehole  
Log Data Report

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Borehole

40-02-01

Log Event A

### Borehole Information

Farm : <u>S</u>	Tank : <u>S-102</u>	Site Number : <u>299-W23-148</u>
N-Coord : <u>36,266</u>	W-Coord : <u>75,744</u>	TOC Elevation : <u>664.19</u>
Water Level, ft :	Date Drilled : <u>9/30/1971</u>	

### Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>130</u>	

### Borehole Notes:

According to the driller's records, this borehole was not perforated or grouted. The borehole was originally drilled in September 1971 to a depth of 100 ft. The borehole was deepened to 130 ft in 1973. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

### Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>04/1996</u>	Calibration Reference : <u>GJPO-HAN-5</u>	Logging Procedure : <u>P-GJPO-1783</u>

### Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>05/21/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>130.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>52.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>
Log Run Number : <u>2</u>	Log Run Date : <u>05/22/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>53.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>0.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>
Log Run Number : <u>3</u>	Log Run Date : <u>05/22/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>60.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>40.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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## Analysis Information

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Analyst : S.D. Barry

Data Processing Reference : P-GJPO-1787

Analysis Date : 02/19/1997

### Analysis Notes :

This borehole was logged in two log runs and one relog section. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation. Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The only man-made radionuclide detected in this borehole was Cs-137. The presence of Cs-137 was measured continuously from the ground surface to about 1.5 ft and at the bottom of the borehole. The maximum Cs-137 concentration was 11.5 pCi/g at the ground surface.

The K-40 log plot shows regions of elevated concentration values from 48 to 53 ft and 55 to 59 ft. Beginning at about 68 ft, the K-40 and Th-232 concentration values sharply increase and the U-238 concentration values begin a gradual increase.

The interval between 40 and 60 ft was relogged to check the quality of the radionuclide concentration measurements made by the SGLS. The concentrations of the anthropogenic and natural radionuclides were calculated using separate data sets at the overlapping depths. The concentrations of these radionuclides were within the two-sigma uncertainty of the measurements, verifying the good repeatability of the measurements. The relog plot shows that the potential repeatability problem may be less than predicted.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank S-102.

### Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

The interval between 40 and 60 ft was relogged as a quality assurance measure to establish the repeatability of the radionuclide concentration measurements. The radionuclide concentrations shown were calculated using the separate data sets provided by the original and rerun logging runs.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.